Preliminary Datasheet

HPSD 9200 Pressure Transducer

General description

The HPSD 9200 pressure transducer has been designed for precise pressure sensing applications. Its ceramic measuring cell, employing the piezoresistive measuring principle, is enhanced with programmable (ASIC) temperature compensation and calibration, ensuring accuracy across a compensated temperature range and delivering enduring stability. The transducer's superior performance and accuracy render it well-suited for a diverse spectrum of applications.

The programmable temperature compensation feature guarantees a low total error over the 0 to 70°C temperature range. Operating seamlessly on a single power supply (ranging from 3 to 5,5 V) and featuring a broad compensated temperature range, this transducer affords Original Equipment Manufacturer (OEM) users unparalleled flexibility for various applications involving dry air or non-corrosive gases and liquids.

Applications

- HVAC
- Process control
- Pneumatics control
- Industrial
- Automation

Features

- Supply voltage: 3 V to 5,5 V
- Ratiometric voltage output (10% to 90% of supply voltage)
- I^2C digital output
- 15 bits of digital output (pressure + temperature)
- High accuracy over 0 to 70°C
- Pressure range from 1 to 100 bar
- Total accuracy down to 1% FS over 0 to 70°C, all effects included (maximum)
- Gage configuration

RoHS COMPLIANT

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Available type overview

Pressure range	1 bar	10 bar	20 bar	50 bar	100 bar
ID group	HPSD 9200-001B	HPSD 9200-010B	HPSD 9200-020B	HPSD 9200-050B	HPSD 9200-100B
Pressure type	gage				
V_{OUT}	10 to 90% of V_{CC}				
Temperature ranges	Operating: -25 to 85°C, Compensated: 0 to 70°C, Storage: -40 to 125°C				
Over Pressure [1]	2 bar	20 bar	40 bar	100 bar	200 bar
Burst pressure [2]	3 bar	30 bar	60 bar	150 bar	300 bar

Performance characteristics

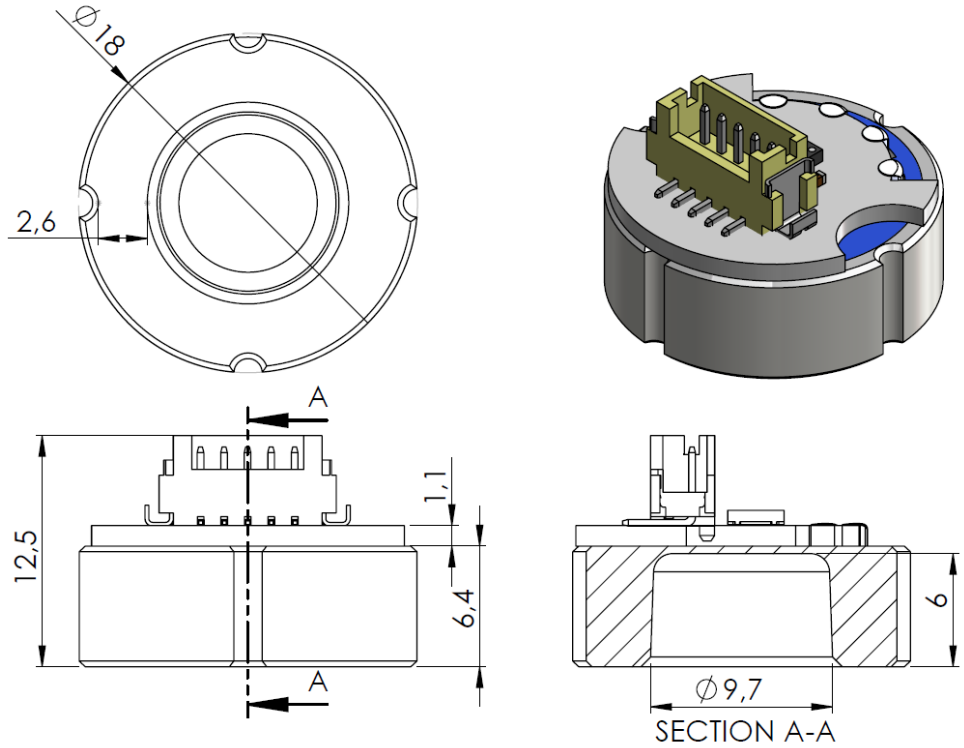
T_{AMB}=25°C, unless otherwise noted

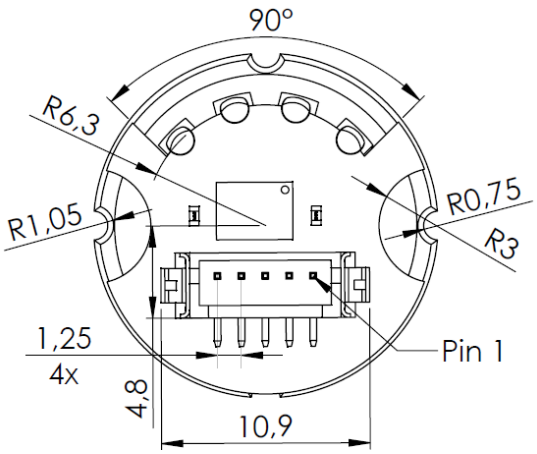
Parameter	Symbol	Min.	Type	Max.	Unit
Power supply					
Supply voltage	V_{CC}	3		5,5	V
Current consumption	I_{CC}		4,6	5,5	mA
Analog output (pressure) [3]					
Offset voltage [4]	V_O		10		%
Full scale output (FSO) [5]	V_{FSO}		90		%
Full scale span (FSS) [6]	V_{FSS}		80		%
Digital output (pressure), 15 bits					
Offset voltage [7]	V_O		3277		counts
Full scale output (FSO) [8]	V_{FS}		29491		counts
Full scale span (FSS) [9]	V_{FSO}		26214		counts
Digital output (temperature), 15 bits					
Temperature output @ 0°C	T_o		8192		counts
Temperature output @ 70°C	T_s		24576		counts
Accuracy (pressure) @ 25°C [10]	E_a		0,5	±1,5	% FSS
Total accuracy (pressure) @ 0 to 70°C [11]	E_{ta}		1	±2	% FSS
Response time	E_{rt}		1,3		ms
Repeatability [12]	E_r		±0,05		% FSS
Nonlinearity & pressure hysteresis (BFSL) [13]	E_l		±0,1	±0,3	% FSS
Load resistance	R_L	2		∞	kΩ
Media compatibility	see spec. note [14]				
Weight	W		5		g

Specification notes

1) Over pressure is the maximum pressure which may be applied without causing damage to the sensing element.
2) Burst pressure is the maximum pressure which may be applied without causing leakage damage to the sensing element.
3) Analog output signal is ratiometric to power supply V_{cc}, digital signal is not ratiometric to the power supply.
4) Offset voltage is the voltage output at zero pressure.
5) Full scale output is the voltage output at full pressure range.
6) Full scale span is the algebraic difference between the output at full scale pressure range and offset.
7) Digital value of offset is output at zero pressure.
8) Full scale output is digital output at full pressure range.
9) Full scale span is the algebraic difference between the output at full scale pressure range and offset.
10) Accuracy includes all effects (offset, span, nonlinearity, pressure hysteresis and repeatability) at room temperature and represents maximum deviation of transducer signal from ideal characteristic.
11) Total accuracy includes all effects (offset, span, nonlinearity, pressure hysteresis and repeatability) included with all temperature effects of offset and span. It describes overall error and represents maximum deviation of transducer signal from ideal characteristic in compensated temperature range from 0 to 70°C.
12) Repeatability is defined as typical deviation of the output signal after 10 pressure cycles.
13) Nonlinearity is defined as the BFSL (best fit straight line) across entire pressure range.
14) Media compatibility: clean, dry, and noncorrosive gases and liquids to ceramics Al_2O_3.

Outline dimensions & Pinout





Pin assignment		
Pin	Name	Function
1	V_{CC}	Positive power supply
2	GND	Ground
3	OUT	Analog output
4	SDA	I^2C data
5	SCL	I^2C clock

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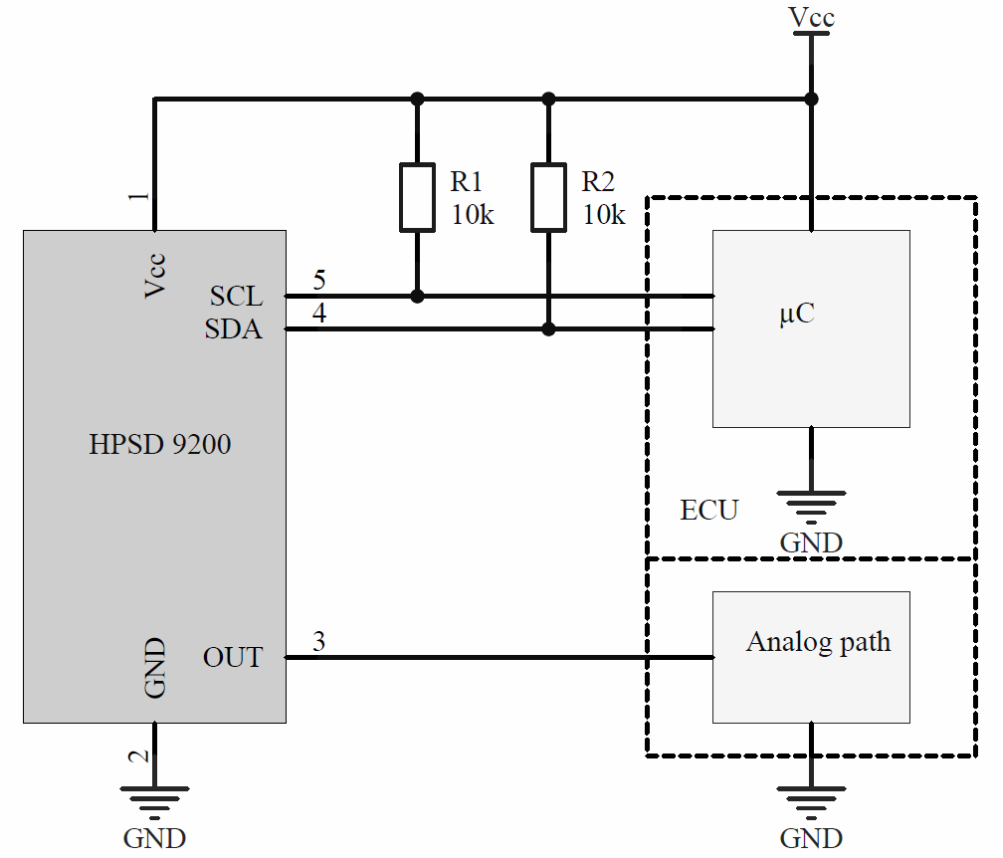
Typical Operating Circuit



Notes:

- Signal lines of I²C must be connected to the external pull-up resistors (≥2 kΩ).
- The communication protocol I²C is explained in Application note 005.

Ordering guide

Transducer type	Pressure range
HPSD 9200	001B
	010B
	020B
	050B
	100B

Pressure range	
001B	1 bar
010B	10 bar
020B	20 bar
050B	50 bar
100B	100 bar

Note: Other configurations are possible on request.